

Risk Assessment Needs for Land Management Decisions at Cherry Point, Whatcom County, Washington

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Abstract

The Washington State Department of Natural Resources (DNR) is responsible for managing some of the tidelands, all of the marine bedlands, and the associated natural resources along the Cherry Point reach of Puget Sound. Cherry Point historically provided spawning habitat for more than half of Puget Sound's herring population. Herring spawning in this reach has dropped by more than 90 percent from the 1970s. The geography of Cherry Point also allows direct deep-water access for industries and shipping. At present, three industrial facilities lease state lands for deep water piers. Over the years several proposals for additional deep water piers have been made, one of which is pending. DNR must strike a responsible balance between protecting habitat and supporting the needs of commerce and navigation. We are using ecological risk assessment as a tool to help DNR make the decisions to meet these management needs.

Cherry Point

Depending on one's perspective, the Cherry Point reach is a place with habitat, commerce, fisheries, pollution, or natural resources in need of protection. To date, most of the decisions made along Cherry Point have been made on a case-by-case, project-by-project basis. To manage the resources of the reach wisely, natural resource managers need to consider options for uses in the area and their potential impacts from a comprehensive, regional perspective. We believe that regional risk assessment provides a tool to do this.

Geography and Uses

Cherry Point, Whatcom County, Washington is a point of land approximately midway between Bellingham, Washington and the Canadian border. The "Cherry Point reach" is the stretch of beach that extends from Point Whitehorn in the north to the tip of Sandy Point in the south. Offshore, the bottom drops to greater than 70 feet of depth within a few hundred yards of the shore. The beach itself contains stretches of sand, mud, rocks and cobbles of various sizes.

The adjacent uplands support a mix of uses. Much of the area is zoned "industrial," and two oil refineries and an aluminum smelter are situated along the shore. There are also farms, forests, some residences, and a wildlife refuge nearby. Because it is located between the large urban area of Vancouver, British Columbia and the medium-sized city of Bellingham, Washington, the potential for more intensive use of uplands, tidelands, and bedlands is often under discussion. Figure one is an aerial photo of the area taken in 1998.

The area is used for shipping, and proposals to develop the area further for greater shipping capacity are under consideration. There have been commercial and tribal fisheries for herring in the past. There are stormwater, industrial process water, and sewage outfalls along the shore. In the past, there has been evidence of contaminated sediments, but all sediments that have been tested currently meet the Department of Ecology's sediment quality standards.

Natural Resources and Natural Resource Managers

Cherry Point hosts an abundance of natural resources, and of natural resource managers. Among the agencies responsible for aspects of natural resource management are the Washington State Department of Fish and Wildlife (fisheries), the Lummi Nation and the Nooksack Tribe (fisheries and tribal lands), the Department of Ecology (air, water, and sediment quality), Whatcom County (upland uses and zoning), the Washington State Department of Natural Resources (state-owned tidelands, bedlands, and uplands), and a variety of Federal agencies that share or oversee these responsibilities.

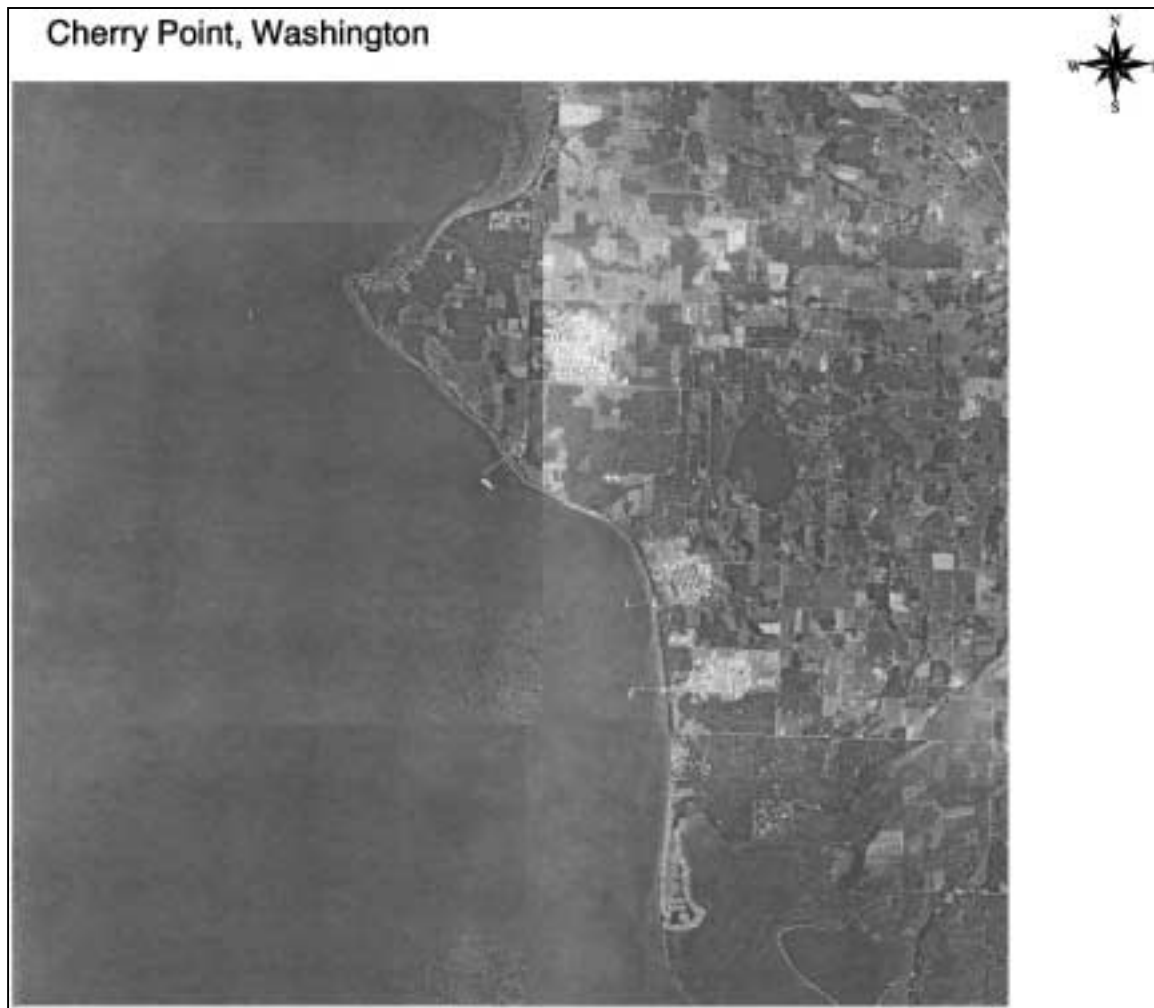


Figure 1 Cherry Point, Whatcom Co., Washington. Washington State Department of Natural Resources photograph.

Figure 2 provides a map of land ownership in the Cherry Point area. In addition to the state-owned tidelands and bedlands, and the areas under lease by DNR to specific users, there are tribal, private, and state-owned park lands in the vicinity.

Part of the Department of Natural Resources' mission statement for the management of aquatic lands is, "Aquatic lands will be managed for current and future citizens of the state; to sustain long-term ecosystem and economic viability; and to ensure access to the aquatic lands and the benefits derived from them." The DNR acts as both landlord of the state-owned aquatic lands, and as a trustee for the natural resources that they support. DNR is working toward more regionally based, rather than a project-by-project, land management. Regional risk assessment provides one tool to compare fundamentally different kinds of impacts on a regional basis.

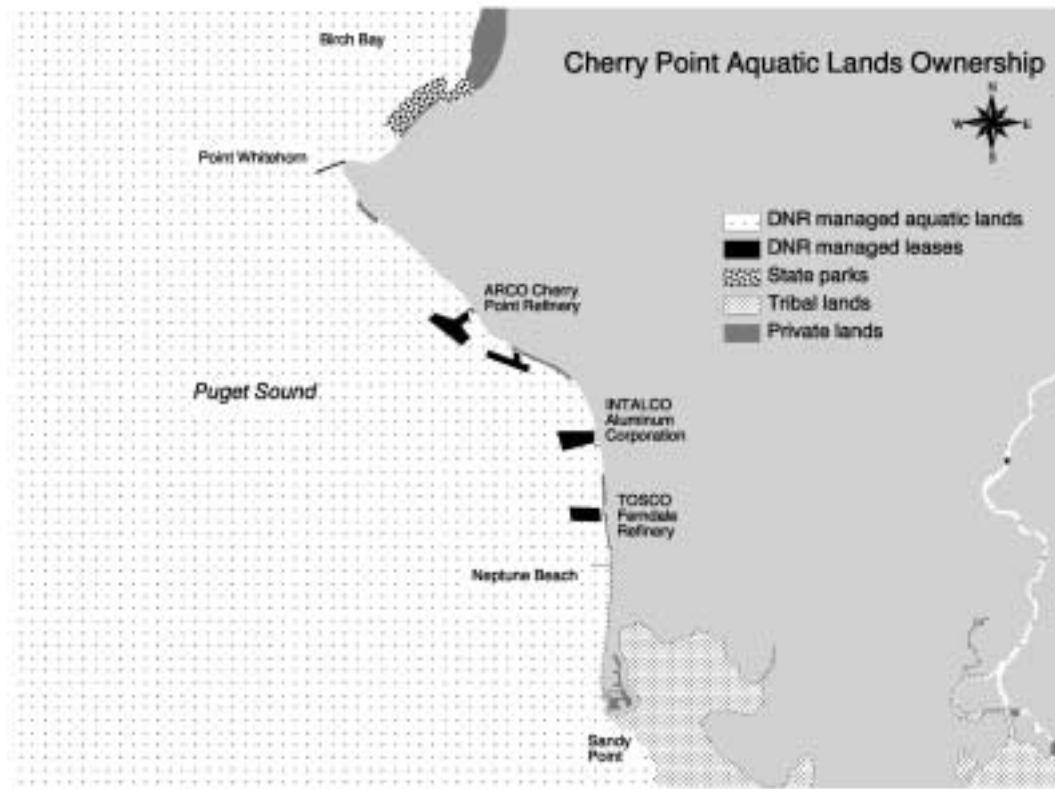


Figure 2 Land ownership at Cherry Point. Washington Department of Natural Resources data.

Habitat and Species

Figures 3 through 6 show areas used by different organisms off Cherry Point. The area has a high biomass and high diversity of marine vegetation compared with other areas. Several invertebrate species are found in the area, as are a variety of fish. Marine mammals and seabirds also use the area. Herring and surf smelt spawn along the beach, and salmon use different areas for different phases of their life cycle.

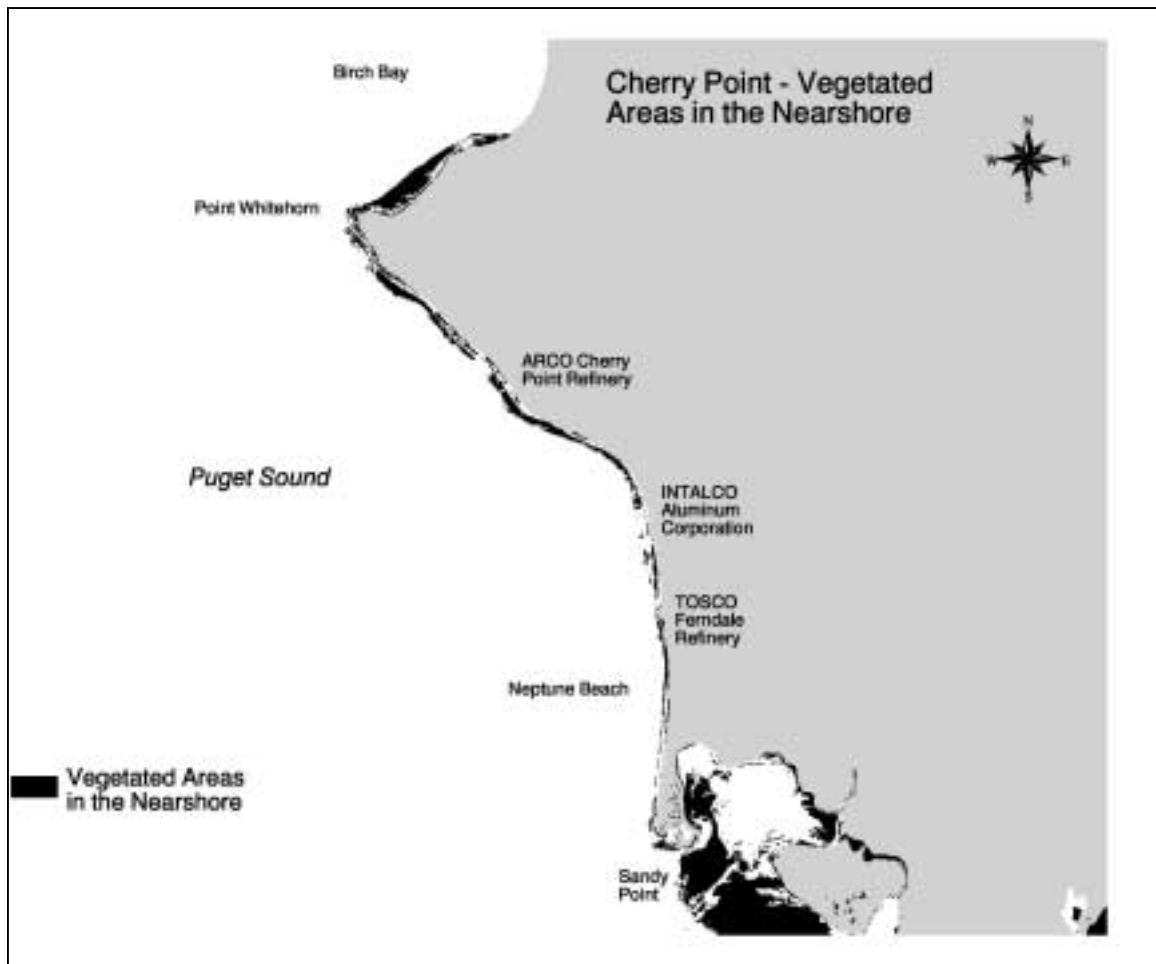


Figure 3 Vegetated areas in the nearshore at Cherry Point. Washington Department of Natural Resources data.

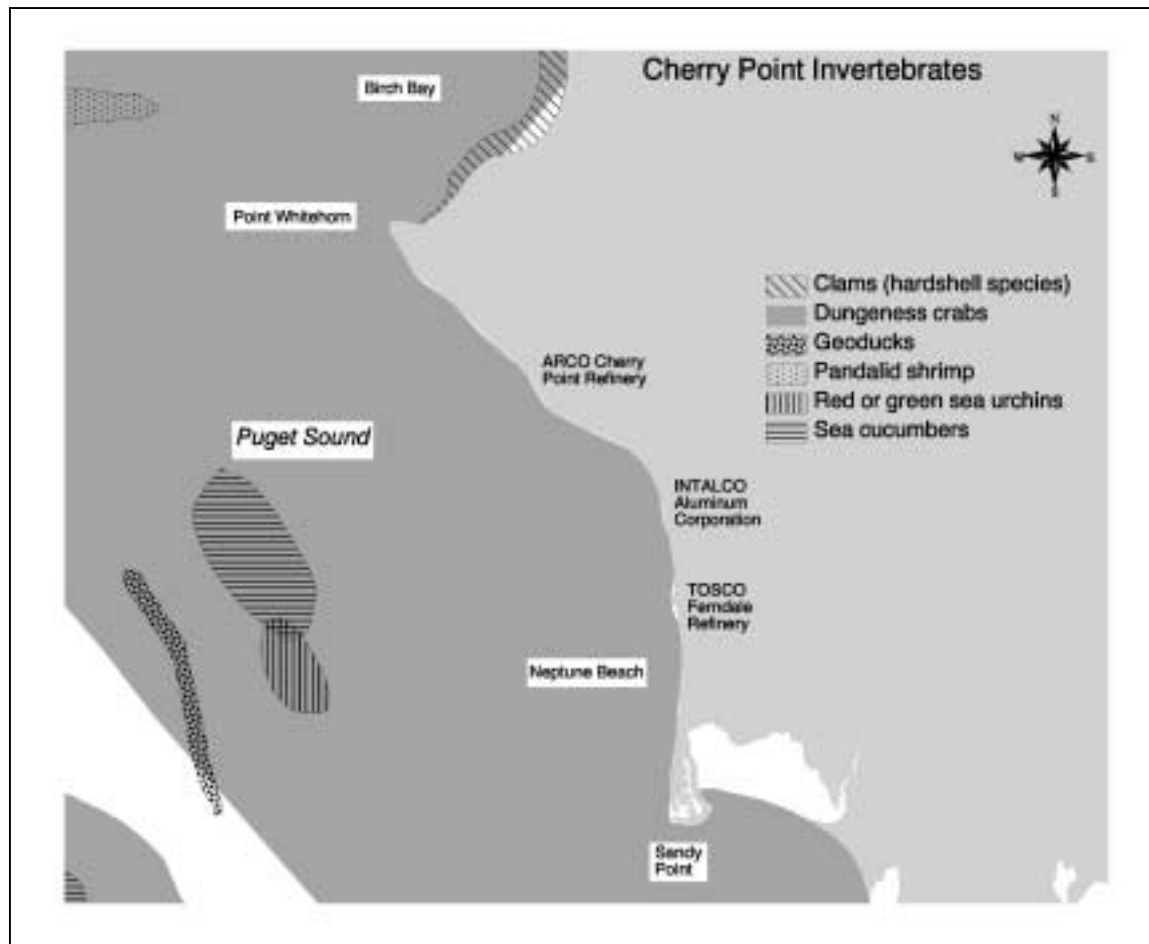


Figure 4 Invertebrate distribution off Cherry Point. Washington Department of Fish and Wildlife data.

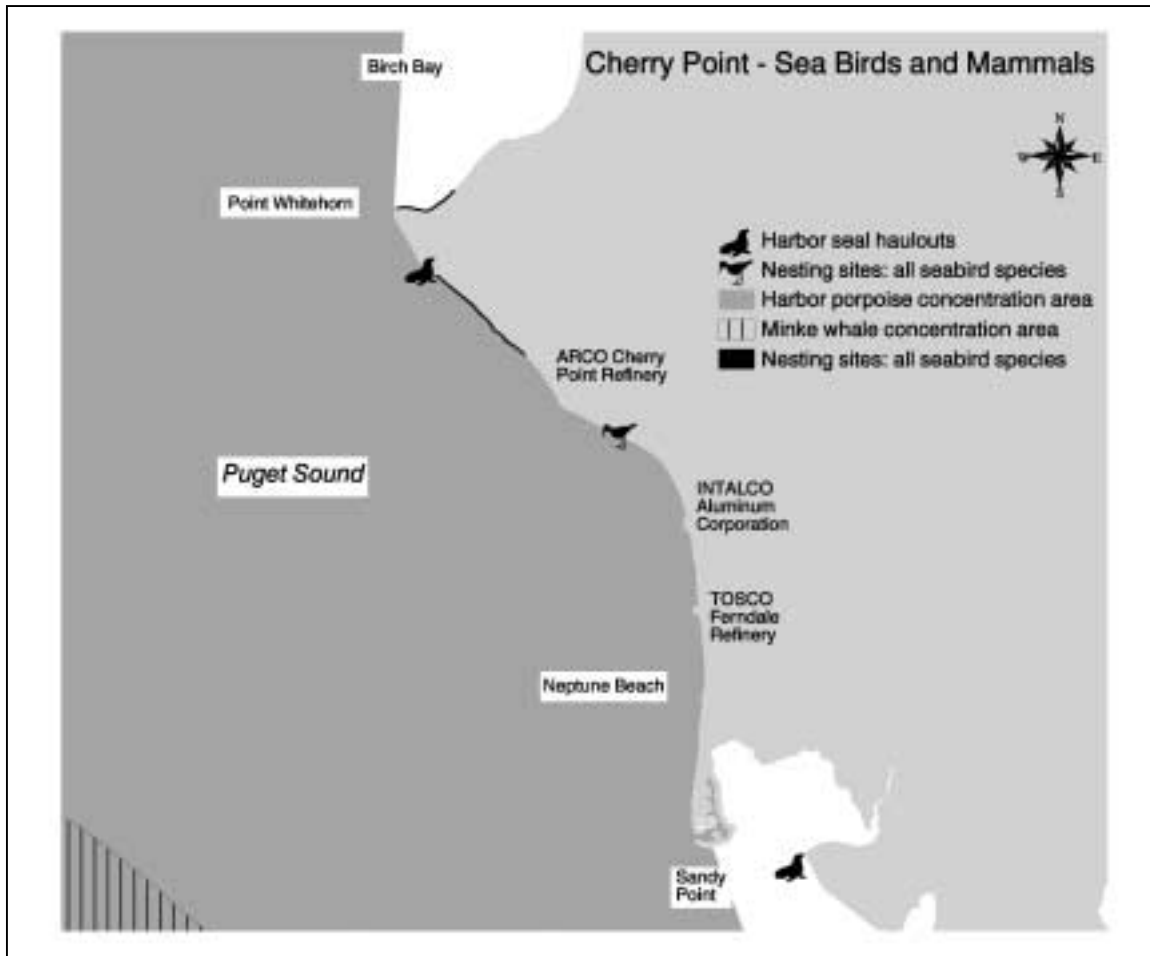


Figure 5 Bird and mammal distribution off Cherry Point. Puget Sound Water Quality Authority and Washington Department of Fish and Wildlife data.

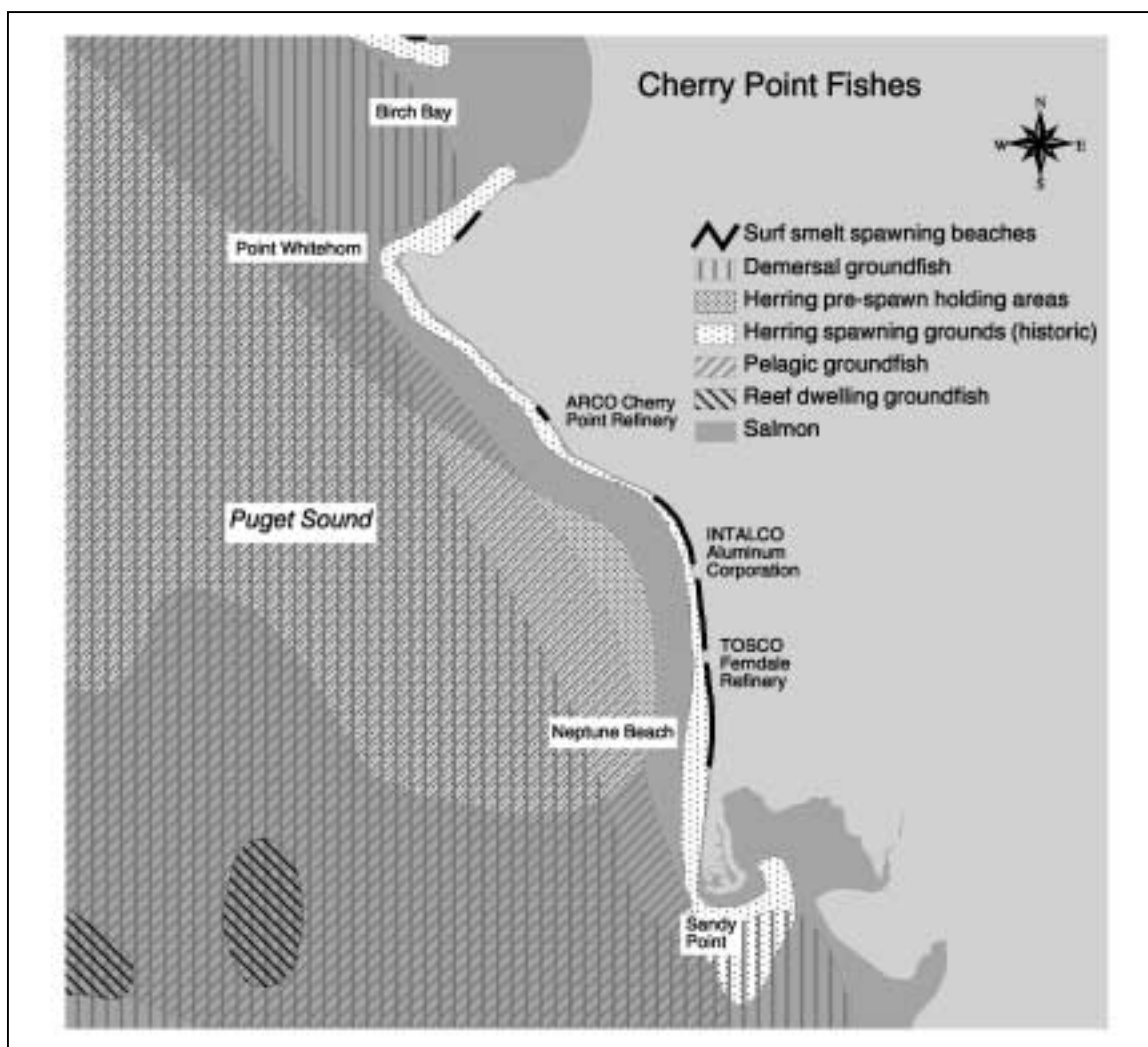


Figure 6 Fish distribution off Cherry Point. Salmon use the entire area at different times of their life cycle. Washington Department of Fish and Wildlife data.

Herring as Indicator Species

Pacific herring (*Clupea harengus pallasii*) have been used as an “indicator species” to assess the functioning of the Cherry Point ecosystem. They are not the only organism of concern, but they are a commercially valuable species, so data based on fisheries management are available. They are also centrally located in the food web, acting as a prey species for marine mammals, birds, and other fish. Among Puget Sound herring stocks, the Cherry Point stock is unique in that it spawns in the spring, rather than in the winter as neighboring stocks do. In the 1970s, the Cherry Point stock comprised more than half of the herring biomass in Puget Sound. Since the 1970s, the size of the stock has shrunk from approximately 14,000 tons to about 800 tons in the 2000 spawning season.

As the size of the Cherry Point stock has diminished, so has the amount of the spawning grounds used. Figure 7 shows the herring use of spawning grounds, from 1973 to the present. Washington Department of Fish and Wildlife biologists think that the unutilized areas are still suitable for spawning, and that it is the size of the stock rather than destruction of habitat that caused the observed trend of less spawning area being used.

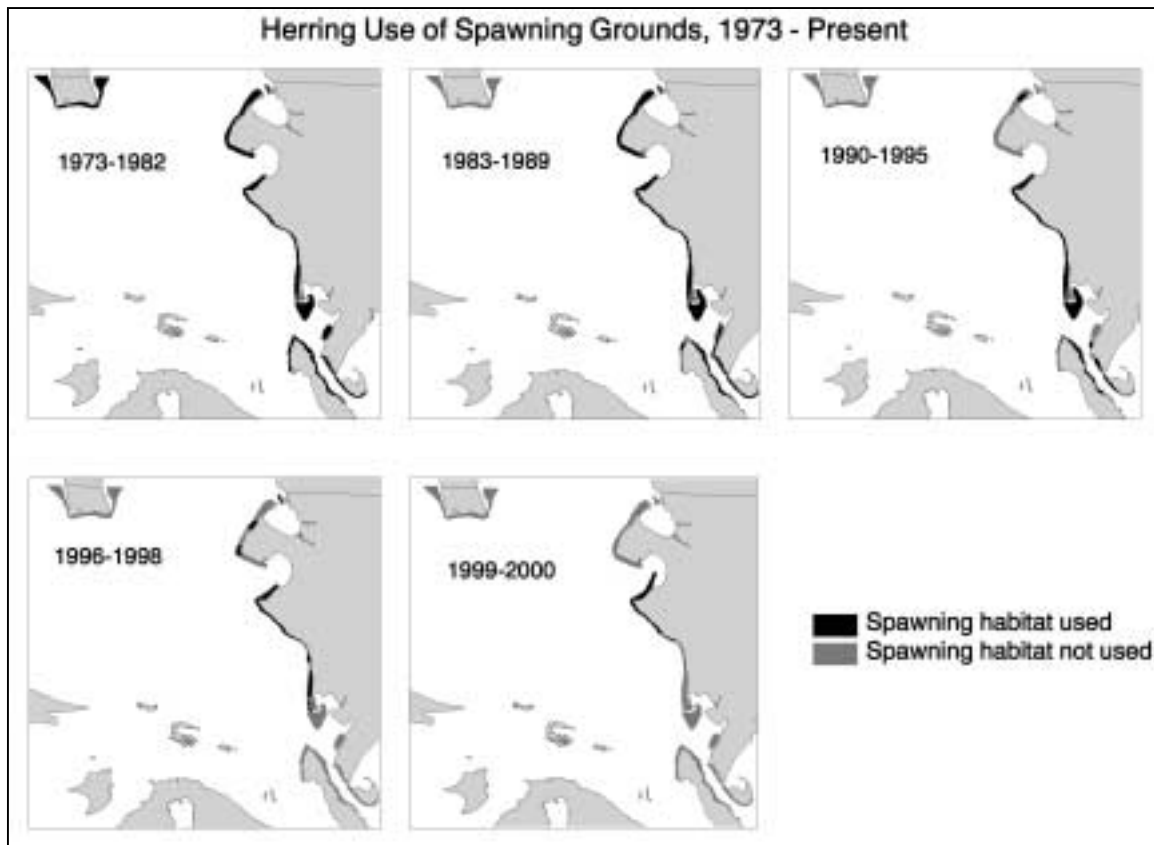


Figure 7 Herring use of spawning grounds at Cherry Point, 1973 – present. Washington Department of Fish and Wildlife data.

Toward the center of the figure are some bars and squares that show some of the shoreline management administrative changes and proposals. In 1976, the uplands adjacent to Cherry Point were zoned “conservancy.” In 1987, that designation changed to “industrial,” opening the area to the possibility of more industrial development joining the existing aluminum smelter and two refineries. To date (April 2001), however, additional industrial development has not taken place. A number of proposals to develop the uplands and build additional piers have been considered, and the demand for access to space for upland development and access to deep water via an additional pier continues.

DNR, as manager of the state-owned aquatic lands adjacent to Cherry Point, has an obligation to protect the natural resources at Cherry Point and provide for the economic benefits that can come from using those lands. We need tools that allow us to account for the ways in which existing and proposed uses impact the natural resources. The Regional Risk Assessment methodology forces one to define the geographic area(s) of interest, and the endpoints (herring or other creatures or resources) of concern. It provides a semi-quantitative method for comparing very different “risks” or “inputs” to one another, and for estimating the cumulative result of those inputs on the resource(s) of concern. It also allows for a methodical comparison of alternatives, the development of testable hypotheses, and it provides a framework for discussion among parties with differing interests and priorities.